CLAIMS

1. Polypeptide possessing a CDase activity, characterized in that it is derived from a native CDase by addition of an amino acid sequence, with the proviso that said polypeptide has no UPRtase or thymidine kinase activity.

2. Polypeptide according to claim 1, wherein the amino acid sequence, added to the native CDase, is linked to the C terminal end of the native CDase.

3. Polypeptide according to claim 1 or 2 wherein the amino acid sequence, added to the native CDase, is between 10 and 1000 amino acid length.

4. Polypeptide according to claim 3, wherein the amino acid sequence, added to the native CDase, is between 100 and 400 amino acid length.

5. Polypeptide according to claim 4, wherein the amino acid sequence, added to the native CDase, is between 200 and 300 amino acid length.

6. Polypeptide according to one of claims 1 to 5, wherein the amino acid sequence, added to the native CDase, derives from a polypeptide possessing an UPRTase activity.

7. Polypeptide according to claim 6, characterized in that said polypeptide possessing an UPRTase activity derives from a yeast UPRTase, in particular that encoded by the Saccharomyces cerevisiae FUR1 gene.

8. Polypeptide according to claim 7, characterized in that the amino acid sequence, added to the native CDase, derives from an amino acid sequence which is substantially that depicted in SEQ ID NO: 2 sequence identifier, starting at the Ser residue in position 2 and finishing at the Val residue in position 216.

9. Polypeptide according to claim 8, characterized in that the amino acid sequence, added to the native CDase, is as depicted in SEQ ID NO: 2 sequence identifier, starting at the Ser residue in position 2 and finishing at the Val residue in position 216.

10. Polypeptide according to one of claims 1 to 9, characterized in that said native CDase is a yeast CDase, in particular that encoded by the Saccharomyces cerevisiae FCY1 gene.

11. Polypeptide according to claim 10, characterized in that the native CDase comprises an amino acid sequence which is substantially as depicted in SEQ ID NO: 1 sequence identifier, starting at the Met residue in position 1 and finishing at the Glu residue in position 158.

12. Polypeptide according to claim 11, characterized in that the native CDase comprises an amino acid sequence as depicted in SEQ ID NO: 1 sequence identifier, starting at the Met residue in position 1 and finishing at the Glu residue in position 158.

13. Polypeptide according to claim 10,

characterized in that it comprises an amino acid sequence which is substantially as depicted in SEQ ID NO: 1 sequence identifier, starting at the Met residue in position 1 and finishing at the Val residue in position 373.

14. Polypeptide according to claim 13, characterized in that it comprises an amino acid sequence as depicted in SEQ ID NO: 1 sequence identifier, starting at the Met residue in position 1 and finishing at the Val residue in position 374.

15. Polypeptide according to one of claims 1 to 14, characterized in that it exhibits a CDase activity which is appreciably higher than that of said native CDase.

16. Nucleotide sequence which encodes a polypeptide according to one of claims 1 to 15.

17. Recombinant vector which carries a nucleotide sequence according to claim 16, placed under the control of the elements which are required for expressing it in a host cell.

18. Recombinant vector according to claim 17, characterized in that said vector is selected from the group consisting of plasmid and viral vectors, where appropriate combined with one or more substances which improve(s) the transfectional efficacy and/or the stability of the vector.

19. Recombinant vector according to claim 18, wherein said substance which improve the transfectional

efficacy and/or the stability of the vector is selected from the group comprising cationic lipids, cationic polymers, lysophospholipides and polypeptides.

20. Recombinant vector according to Claim 18, characterized in that said vector is a viral vector which is derived from a pox virus, from an adenovirus, from a retrovirus, from a herpes virus, from an alphavirus, from a foamyvirus or from an adenovirusassociated virus.

21. Recombinant Vector according to claim 20, characterized in that said vector derived from a Modified Vaccinia Ankara (MVA) virus.

22. Recombinant Vector according to claim 21,characterized in that the nucleotide sequence according to claim 16 is inserted at a site of a naturally occurring deletion within the MVA genome selected from the group consisting in deletion I, II, III, IV, V and VI.

23. Recombinant vector according to claim 22, wherein the site of the naturally occurring deletion is deletion III.

24. Recombinant vector according to one of claims 17 to 23, characterized in that the elements which are required for the expression comprise a promoter.

25. Recombinant vector according to claim 24, characterized in that the promoter is the promoter of the thymidine kinase 7.5K gene.

26. Recombinant vector according to claim 20,

characterized in that said vector is an adenoviral vector which lacks all or part of at least one region which is essential for replication and which is selected from the E1, E2, E4 and L1-L5 regions.

27. Recombinant vector according to Claim 26, characterized in that said vector is an adenoviral vector which additionally lacks all or part of the non-essential E3 region.

28. Recombinant vector according to claim 24, characterized in that said promoter is the cytomegalovirus (CMV) early promoter.

29. Recombinant vector according to one of claims 17 to 28, characterized in that it additionally comprises one or more genes of interest which is/are selected from the genes encoding interleukins IL-2, IL-4, IL-7, IL-10 and IL-12, interferons, tumor necrosis factor (TNF), colony stimulating factors (CSF) and factors acting on angiogenesis.

30. Recombinant vector according to claim 29, characterized in that the gene of interest encodes a polypeptide which is selected from IL-2 and INFγ.

31. Process for preparing a viral particle, wherein:

(i) a recombinant vector according to one of claims 17 to 29 is introduced into a complementing cell which is able to complement said vector in trans so as to obtain a tranfected complementing cell,

(ii) said transfected complementing cell is cultured under conditions which are appropriate for enabling said viral particle to be produced, and

(iii) said viral particle is recovered from the cell culture.

32. Viral particle which comprises a recombinant vector according to one of claims 17 to 30 or was obtained in accordance with the process according to claim 31.

33. Host cell which comprises a nucleotide sequence according to claim 16 or a recombinant vector according to one of claims 17 to 30, or which is infected with a viral particle according to claim 32.

34. Composition which comprises a polypeptide according to one of claims 1 to 15, a nucleotide sequence according to claim 16, a recombinant vector according to one of claims 17 to 30, a viral particle according to claim 32 or a host cell according to claim 33, in combination with a pharmaceutically acceptable excipient.

35. Composition according to claim 34, characterized in that it comprises a polypeptide according to one of Claims 1 to 15 and a second polypeptide of interest, in particular a polypeptide selected from IL-2 and INFγ.

36. Composition according to claim 34, characterized in that it comprises a nucleotide sequence according to one of Claim 16 and a second nucleotide sequence of interest which encodes a

polypeptide selected from IL-2 and INFγ.

37. Therapeutic or prophylactic use of a polypeptide according to one of claims 1 to 15, of a nucleotide sequence according to claim 16, of a recombinant vector according to one of claims 17 to 30, of a viral particle according to claim 32 or of a host cell according to Claim 32 for preparing a medicament which is intended for treating the human or animal body by gene therapy or by administering protein which has been produced by the recombinant route.

38. Therapeutic use according to claim 37 for preparing a medicament which is intended for treating cancers, tumors and diseases which result from unwanted cell proliferation.

39. Method for treating diseases by gene therapy, characterized in that a nucleotide sequence according to claim 16, a recombinant vector according to one of claims 17 to 30, a viral particle according to claim 32 or a host cell according to claim 33 is administered to an organism or a host cell which is in need of such a treatment.

40. Method according to claim 39, or therapeutic use according to claim 37 or 38, wherein pharmaceutically acceptable quantities of a prodrug, advantageously an analog of cytosine, in particular 5-FC, are administered to said host organism or cell.